Cable Routing Procedures for Dell™ PowerEdge™ R515 Systems

A Dell™ Technical White Paper

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Dell™ | Datacenter Infrastructure Engineering

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Introduction

This white paper covers recommended cable routing procedures for the Dell™ PowerEdge™ R515 system in the following racks:

- PowerEdge™ 2410
- PowerEdge™ 4210
- PowerEdge™ 2420
- PowerEdge™ 4220 (including wide and deep versions)
- PowerEdge™ 4820 (including wide and deep versions)

If you are using the optional CMA, following these procedures will allow you to extend the system from the rack for service without powering down or disconnecting the cables. If you are not using the CMA, following these procedures will ensure secure attachment and strain relief of the cables behind the system. For guidelines on how to route cables within the rack, refer to the Dell *Best Practices Guide for Rack Enclosure* white paper.

Section 1: Cabling a Dell™ PowerEdge™ R515 With a Cable Management Arm (CMA)

This section details how to cable a PowerEdge™ R515 system using a CMA. If you are cabling the system without the optional CMA, refer to Section 2.

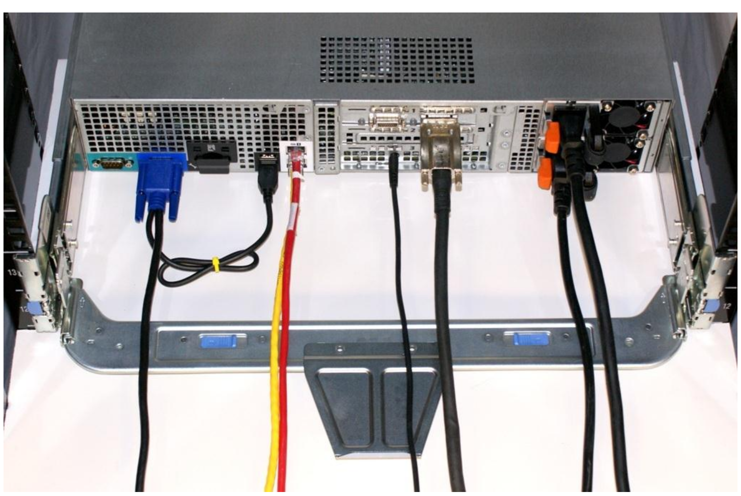
Follow the instructions contained in the *Rack Installation Guide* in the rail kit to install the server into the rack. Once installed, use these instructions to install the cables. All illustrations in the following sections were created using a PowerEdge™ R515 system.

NOTE: PowerEdge™ R515 systems are compatible with the PowerEdge™ R510 rails and CMAs.

1.1 Connecting the CMA Cables to the System

Attach the CMA tray to the back of the rails as described in the *CMA Installation Instructions* provided in the CMA kit. Connect all applicable cables to the rear of the system and verify that all connections are secure. See Figure 1.

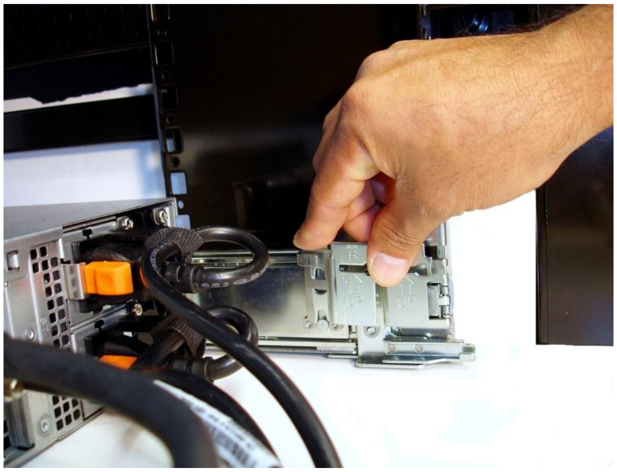
Figure 1: System with Cables Installed



1.2 Installing the Inner CMA Attachment Bracket

As described in the *Rack Installation Instructions,* locate and attach the appropriate inner CMA attachment bracket based on which side you wish to mount the CMA. Use the bracket marked "A" for mounting the CMA on the left side, and the bracket marked "B" for mounting on the right side. See Figure 2.

Figure 2: Attaching the Inner CMA Attachment Bracket



1.3 Routing the Power Cables Through the Strain Reliefs

After you have installed the tray and cables, route the power cables through the strain reliefs located on the power supply handles as shown in Figure 3.

Figure 3: Routing Power Cables Through the Strain Reliefs



1.4 Routing the Cables Through the CMA

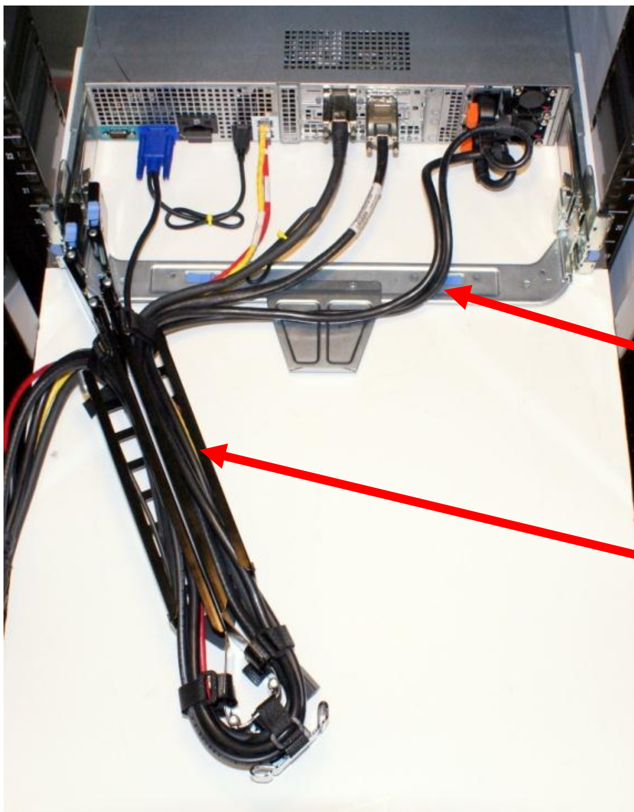
The CMA can be installed on either the rear right or rear left side of the rails. Mounting the CMA on the side that is opposite of the power supplies (left-side mount) is recommended; otherwise, the CMA must be partially disconnected in order to remove the power supplies. Refer to Section 3 for details on power supply replacement.

NOTE: For guidelines on how to route cables within the rack, refer to the Dell *Best Practices Guide for Rack Enclosures* white paper.

1.5 Left-Side Mounting Instructions

1. Install the CMA on the rear left side of the rails by attaching both CMA housings to the attachment brackets on the rails.
2. Route the cables through the CMA while avoiding twisting the cables. Use the hook and loop straps on the CMA to secure the cables. For left-side mounting, if the cable bundle includes a keyboard, video, and mouse (KVM) dongle, place the dongle inside the CMA basket. See Figure 4.

Figure 4: Routing the Cables Through the CMA



NOTE: Do not store excess cable slack inside the CMA. The cable may protrude through the CMA, thus causing binding and potentially damaging the cable.

Cables entering the CMA should have a small amount of slack to avoid cable strain when the CMA is extended.

KVM dongle placed inside the basket for Left-Side Mounting.

3. Once you have routed all the cables through the CMA, dress the cable slack between the back of the system and the entrance of the CMA using the tie wraps (shown in yellow in all illustrations) provided in the CMA kit.
4. Clip off the excess length of material from the tie wraps. Make sure that the heads of the tie wraps are positioned so as to avoid interference with adjacent systems. Return the CMA to the closed (retracted) position.
5. Extend the system out of the rack to verify that there is sufficient slack in the cables on both ends of the CMA.

   See Figure 5 for an example of a completed left-side mounted CMA installation.

Figure 5: Left-Side Mounted CMA Installation (Preferred)

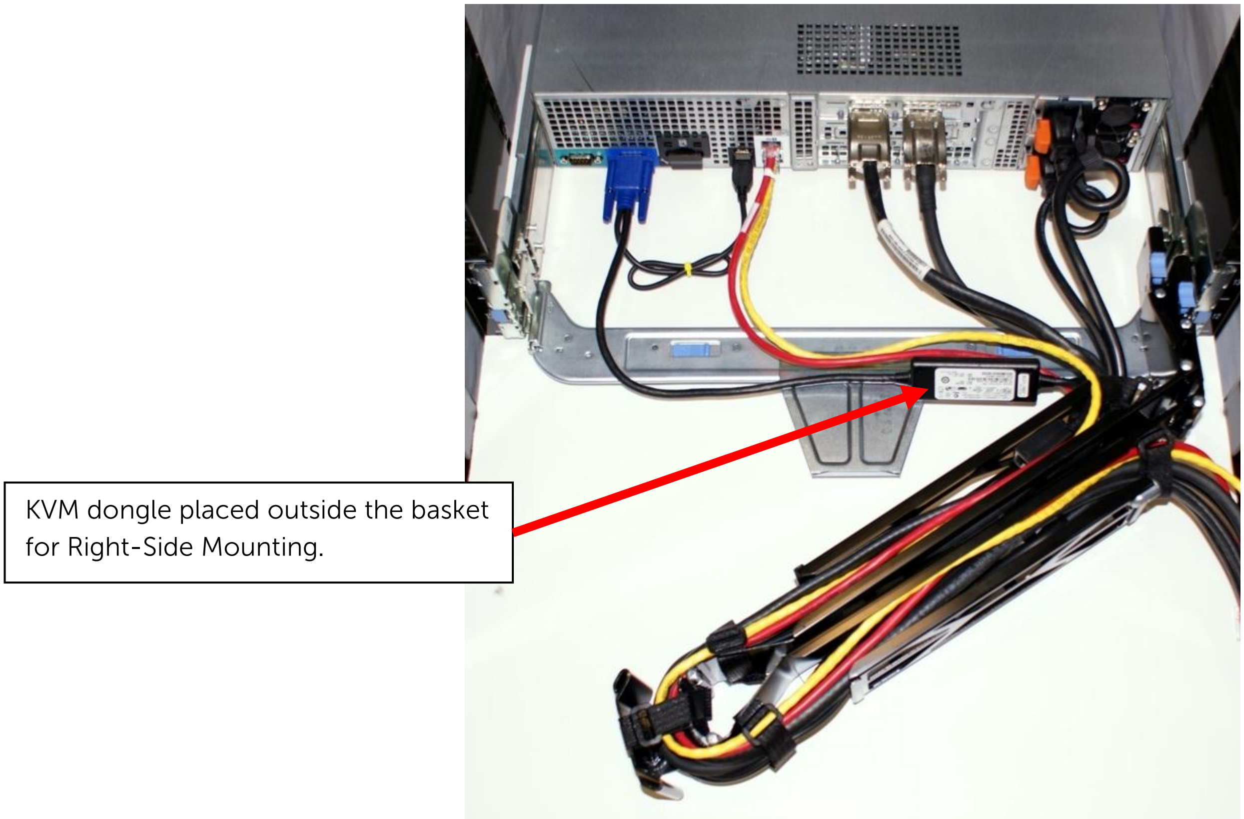


1.6 Right-Side Mounting Instructions

1. Install the CMA on the rear right side of the rails by attaching both CMA housings to the attachment brackets on the rails.
2. Route the cables through the CMA while avoiding twisting the cables. Use the hook and loop straps on the CMA to secure the cables.
3. If the cable bundle includes a keyboard, video, and mouse (KVM) dongle, the cable may be too short for the dongle to be placed in the CMA basket. Route the remainder of the cable beyond the dongle through the CMA. DO NOT secure the dongle to the outside of the CMA as this may restrict the ability of the CMA to support full extension of the rails without causing damage to the dongle.
4. Once you have routed all the cables through the CMA, dress the cable slack between the back of the system and the entrance of the CMA using the tie wraps (shown in yellow in all illustrations) provided in the CMA kit.
5. Clip off the excess length of material from the tie wraps. Make sure that the heads of the tie wraps are positioned so as to avoid interference with adjacent systems. Return the CMA to the closed (retracted) position.
6. Extend the system out of the rack to verify that there is sufficient slack in the cables on both ends of the CMA.

See Figure 6 for an example of a completed right-side mounted CMA installation.

Figure 6: Right-Side Mounted CMA Installation



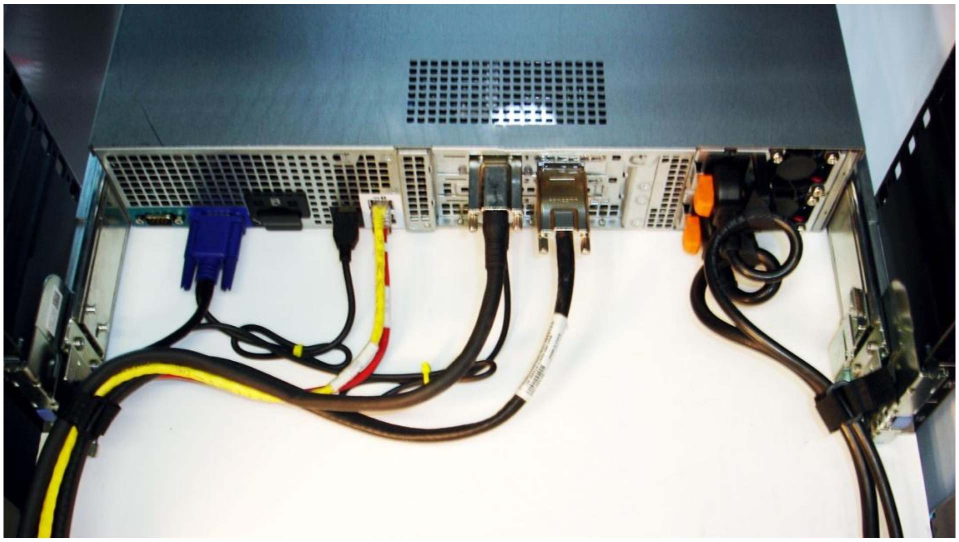
Section 2: Cabling a Dell™ PowerEdge™ R515 System Without a CMA

NOTE: The CMA on Dell™ PowerEdge™ R515 systems is optional. Without the CMA installed, the system must be powered down and all cables disconnected before it can be removed from the rack.

2.1 Routing the Cables

1. Connect all applicable cables to the rear of the system and verify that all connections are secure.
2. Using the hook and loop straps supplied with the rail kit, bundle the cables and secure them to either the left or right CMA attachment brackets as described in the *Rack Installation Instructions*. See Figure 7 for an example of data cables secured to the left CMA bracket and power cables secured to the right CMA bracket.
3. It is recommended that the cables be secured to the outer brackets, but cables may be secured to the inner brackets as well if desired.

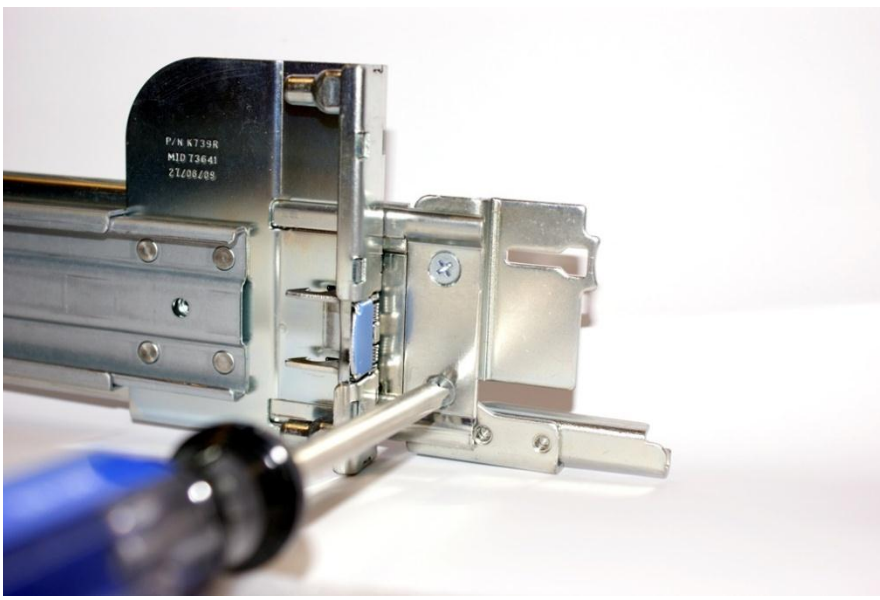
Figure 7: Cable Routing Without a CMA



2.2 Removing the CMA Brackets for Shallow Racks

If you are installing the system into a shallow rack (less than 1 meter deep) and you will not be installing a CMA, the outer CMA brackets may be removed if necessary in order to allow the rails to fit properly into the rack. Remove the brackets by using a #2 Phillips screwdriver to remove the screws used to attach them to the rails as shown in Figure 8.

Figure 8: Removing the CMA Brackets for Shallow Racks



Section 3: Replacing a Power Supply on a PowerEdge™ R515 System With a CMA

3.1 Replacing a Power Supply with a Left-Side Mounted CMA

1. If the **bottom** power supply must be replaced, then remove the tray from underneath the CMA as described in the *CMA Installation Instructions* provided with the CMA kit. If the **top** power supply must be replaced, this step can be skipped.
2. Swing the CMA to its service position.
3. Disconnect the power cord from the power supply and disengage the strain relief.
4. Replace the power supply.
5. Plug in the power cord, re-engage the strain relief, replace the CMA support tray (if it was removed), and return the CMA to the closed (retracted) position.

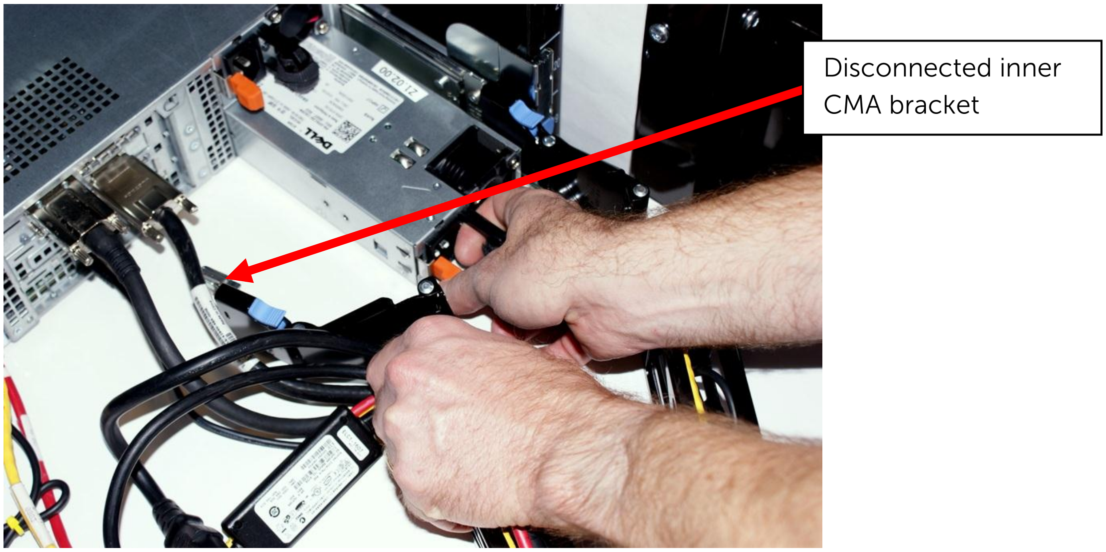
3.2 Replacing a Power Supply with a Right-Side Mounted CMA

1. If the **bottom** power supply must be replaced, then remove the tray from underneath the CMA as described in the *CMA Installation Instructions* provided with the CMA kit. If the **top** power supply must be replaced, this step can be skipped.
2. Swing the CMA to its service position.
3. Disconnect the inner CMA bracket from the rail as shown in Figure 9.
4. While supporting the CMA with one hand, remove and replace the power supply with the other hand as shown in Figure 10.
5. Reinstall the inner CMA bracket to reconnect the CMA.
6. Plug in the power cord, re-engage the strain relief, replace the CMA support tray (if it was removed), and return the CMA to the closed (retracted) position.

Figure 9: Disconnecting the Inner CMA Attachment Bracket



Figure 10: Replacing the Outer Power Supply



Section 4: Cabling a PowerEdge™ R515 System Installed in Static Rails

NOTE: The CMA is compatible with the sliding rails only, not the static rails.

1. Follow the instructions contained in the *Rack Installation Instructions* found in the static rail kit to install the server into a two-post or four-post rack.
2. Install the hook and loop straps provided in the rail kit through the slots in the rear brackets of the rails as described in the *Rack Installation Instructions*.
3. Connect all applicable cables to the rear of the system and verify that all connections are secure.
4. Using the hook and loop straps, bundle the cables and secure them to either the left rail or right rail as described in the *Rack Installation Instructions*. See Figure 11 for an example of data cables that are secured to the left rail and power cables that are secured to the right rail (as viewed from the rear of the system).

Figure 11: Cabling a System Installed in Static Rails

